

RESULTS OF A FIELD SURVEY FOR *CYPERUS*  
*GRAYOIDES* (CYPERACEAE) IN ARKANSAS

A field survey for *Cyperus grayoides* Mohlenbrock was conducted in Arkansas in 1995. In 138 locations surveyed, seven populations were found in two counties. Six populations are new discoveries. All populations were found on Agala loamy sand soils.

*Cyperus grayoides* Mohlenbrock (Cyperaceae) is an obscure member of *Cyperus* section *Laxiglumi*. It has been reported previously from Illinois, Missouri, Texas, and Louisiana, and more recently from Arkansas. In Texas and Louisiana, *C. grayoides* is found on communities variously described as sandhill woodland, pine barrens, xeric riparian sandhills, and deep sand savanna. In Missouri the habitat is sand prairie on the Scotco sandridges of the southeastern lowlands. The original Arkansas location is a barrens area in loose eroding sand of the Agala soil association (Bridges & Orzell 1989; Carter & Bryson 1991; Logan 1994).

The purpose of this paper is to document additional Arkansas locations of *C. grayoides*, to assess its habitat preferences in Arkansas, and to suggest where future survey work may reveal still more populations of the species.

METHODS

A total of 138 sites were surveyed in the field during August and September of 1995. Survey sites were in northeastern Arkansas near the Missouri populations of *C. grayoides*, including Crowley's Ridge and Mississippi Embayment; southwestern Arkansas near the Texas and Louisiana populations; and south-central Arkansas with extensive sand barren communities and the original Arkansas location of *C. grayoides*. Additionally, it was suggested (Paul McKenzie, pers. comm.) that dune soils of the Western Lowlands of the Mississippi Embayment (between Crowley's Ridge and the Ozark Escarpment) might contain populations of this sedge (Table 1).

Because of habitat requirements of *C. grayoides*, only sites with sandy soils were surveyed. In Miller and Lafayette counties Briley loamy fine sand was the only sandy soil (Laurent 1984). In northeastern Lafayette County, areas of Bowie fine sandy loam were examined due to reports of sandhill communities in that area. No appropriate soils were found in Ashley, Bradley, Calhoun, Columbia, or Union counties of southern Arkansas.

In Ouachita and Nevada counties in south-central Arkansas, Agala loamy sand was surveyed because sand barren communities are known on this soil type. No appropriate soils were found in Clark County.

In Mississippi County of northeastern Arkansas, the only appropriate soil is Steele loamy sand (Ferguson & Gray 1971). However, examination

TABLE 1. Summary of areas, counties, site types, and soil types surveyed for *Cyperus grayoides*.

Area/county	Types of sites/Communities	Soils
I. Mississippi Embayment Mississippi Co.	fields	Steele loamy sand
II. Crowley's Ridge Greene Co. Clay Co. Craighead Co	seeps & associated sites seeps & associated sites seeps & associated sites	no particular type no particular type no particular type
III. Western Lowlands of Mississippi Embayment Clay Co. Monroe Co. Randolph Co. Lawrence Co. Jackson Co. Woodruff Co.	cemeteries cemeteries cemeteries cemeteries cemeteries cemeteries	dune/swale areas dune/swale areas dune/swale areas dune/swale areas dune/swale areas dune/swale areas
IV. Southwest Arkansas Miller Co. Lafayette Co.	cemeteries, forests, sand cemeteries, forests, sand	Briley loamy fine Briley loamy fine Bowie fine sandy loam
V. South-central Arkansas Nevada Co. Ouachita Co.	cemeteries, forests, sand cemeteries, forests, sand	Agala loamy sand Agala loamy sand

of soil maps showed this soil only in small, narrow deposits, all of which were included in agricultural fields. Thus, it was concluded that no native vegetation remained, and Mississippi County was eliminated from further consideration.

In the Crowley's Ridge counties of Greene, Clay, and Craighead, no sandy soils are mapped (Robertson 1969; Fielder et al. 1978; Ferguson 1979). However, eroded areas of the ridge have small outcrops of sand and gravel. Since the sandhill communities of south-central Arkansas are often associated with springs and seeps, known seep locations were used to identify potentially sandy areas on Crowley's Ridge.

Intensive agriculture in the Western Lowlands of the Mississippi Embayment has replaced native vegetation on the dune-associated soils, and where native flora remains the soils are generally too wet for agriculture, e.g., wooded sandpond areas. Thus, cemeteries were the primary survey sites in the Western Lowlands.

## RESULTS

Seven populations of *C. grayoides*, including the original state record reported by Logan (1994), were found in Nevada and Ouachita counties of south-central Arkansas. All populations occur on Agala soils, most with enough slope to produce active erosion. In addition, 131 other locations, ranging in size from fractions of a hectare to several sections, were surveyed with negative results.

Although occasionally the sandhill indicator *Froelichia floridana* (Nutt.) Moq. can be seen along roadsides, very little dry sand community vegetation remains in the Western Lowlands. Most cemeteries tended to be too highly altered for native species to persist, and Bermuda grass (*Cynodon dactylon* (L.) Pers.) the most common species in them. The few abandoned cemeteries surveyed either were densely wooded or were surrounded by agricultural fields and had become dominated by weeds such as *Setaria* spp., *Polygonum* spp., and Johnson grass (*Sorghum halepense* (L.) Pers.).

Crowley's Ridge proved no better for sandhill species. One location with *Aristida lanosa* Muhl. ex Ell., a sandhill species, was inspected; however, this site was densely wooded except for occasional highly disturbed areas.

In southwestern Arkansas, most sites with Bowie and Briley soils were dominated by dense, brushy secondary successional forests. Such habitats with dense canopies proved unsuitable for *C. grayoides*. Additionally, few cemeteries were found on these soils and no sandhill species were found in those surveyed. Also an inspection of Miller County Sandhills Natural Area and surrounding lands with Briley soils produced no *C. grayoides*.

Voucher specimens: **ARKANSAS.** Nevada Co.: Ebenezer Cemetery, T12SR20W, section 21, parking area, 3 Aug 1995, *Logan 95-129* (UCA); T13SR20W, sect. 6, sand barrens, 10 Aug 1995, *Logan 95-135* (UCA). Ouachita Co.: T12SR18W, sect. 6, sand barrens, 1 Aug 1995, *Logan 95-122* (UCA); Poison Springs State Forest, T12SR19W, sect. 26, sand barrens, 2 Aug 1995, *Logan 95-123* (UCA); T12SR18W, sect. 18, sand barrens, 3 Aug 1995, *Logan 95-128* (UCA); immediately north of Arkansas Oak Natural Area, T12SR20W, sect. 28, sandy clearing in oak-pine forest, 9 Aug 1995, *Logan 95-133* (UCA); T12SR18W, sect. 16, sand barren, 29 Aug 1995, *Logan 95-136* (UCA).

## DISCUSSION AND CONCLUSIONS

The typical habitat of *C. grayoides* is open barren areas of sandhills where enough slope is present to produce some erosion of the deep, loose sand. The only site where it was found in somewhat compacted, uneroding sand was a cemetery with only a few individuals that did not appear to be thriving. *C. grayoides* appears to require disturbance sufficient to limit competition and to provide open, loose sand for seedling establishment. Such areas are commonly shoulder and side slopes that lack the loamy A horizon re-

ported for the Alaga series (Catlett 1973). Instead, the appearance of the surface soil is more like that described for the white, loose C4 horizon. The most severely disturbed site with *C. grayoides* was on a south and southwest facing slope where the timber had been recently harvested. Here it was thriving, particularly near areas with heavy vehicle traffic.

However, extreme disturbance may be harmful to the species, and, in the long run, timber harvest could result in shrub growth which would diminish the open character of the habitat. The species was never found in shaded situations, and at one site forest encroachment appeared to have limited the population size.

The lack of a completed soil survey for Nevada County prevented a complete survey. When a soil survey for this county is available, it is possible that additional populations of *C. grayoides* will be discovered.

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